SB761
U7R6
76-6

Forest Pest Management

5230
BIOLOGICAL EVALUATION
R2-76-6

MOUNTAIN PINE BEETLE

MIDDLE PARK, COLORADO

Arapaho National Forest,
BLM, State & Private Lands

AUGUST
1976

Rocky Mountain Region

U.S. Department of Agriculture Forest Service

LIBRARY
NOV 9 1976
ROCKY MOUNTAIN STATION

5230
BIOLOGICAL EVALUATION
R2-76-6

MOUNTAIN PINE BEETLE

MIDDLE PARK, COLORADO

Arapaho National Forest,
BLM, State & Private Lands

AUGUST
1976

PREPARED BY: Vernon L M Creasap

VERNON L. M. CREASAP
Entomologist

APPROVED BY:

G L Downing

G. L. DOWNING
Director, Forest Insect & Disease Management

F. A. Dorrell

F. A. DORRELL
Deputy Regional Forester
State and Private Forestry

INTRODUCTION

During the month of August, Vernon Creasap, Entomologist, made a three-day trip to the Middle Park Mountain Pine Beetle Infestation area. The trip involved a survey of lodgepole pine near Big Meadow on National Forest land.

Mountain pine beetle, Dendroctonus ponderosae Hopk., has been in epidemic status for a number of years in the Middle Park lodgepole pine, Pinus contorta Dougl., stands. The losses were found to be significantly lower this year than in previous years. This evaluation was conducted primarily on Arapaho National Forest lands, although the results and recommendations generally apply to all lands in the area.

The present control efforts have involved timber sales and salvage sales. The timber sales have been done by clear cutting and partial cutting methods. In most cases, the partial cutting guidelines are following the R. R. Alexander report of Partial Cutting in Old-Growth Lodgepole Pine[1/]. All land managers should implement the management practices at every opportunity. Private landowners should be encouraged to contact the Colorado State Forest Service for technical assistance in implementing the management guidelines.

TECHNICAL INFORMATION

Causal Agent: Dendroctonus ponderosae Hopkins, mountain pine beetle.

Host: Pinus contorta Douglas, lodgepole pine.

Extent of Infestation: Lodgepole pine mortality occurs in over-stocked and larger diameter stands in the Middle Park area.

Life History: The mountain pine beetle has one generation per year. Adults attack trees from July through August by boring through the bark to the cambium. The females then tunnel upward for 12 inches to 30 inches (these tunnels are called egg galleries).

1/ ALEXANDER, ROBERT R. 1975. Partial Cutting in Old-Growth Lodgepole Pine. RM 136. Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colorado.

The females lay eggs in individual niches along each side of the gallery which is packed with partially-digested wood particles called frass. After hatching, the larvae feed in individual channels (larval galleries) at right angles to the egg gallery in the Phloem. The insect overwinters in the larval stage. In the spring, when the larvae are fully developed, they excavate an oval chamber at the end of the larval gallery and pupate. Finally, mature adults emerge from the chamber by boring through the outer bark and fly to attack new trees, completing the generation.

METHODS

An aerial survey was conducted in June 1976 to estimate and map the number and location of 1975-attacked lodgepole pine trees. From this mapping and with assistance of Arapaho National Forest personnel, areas were selected on National Forest land where ground surveys would yield sufficient data in terms of 1975 and 1976 infested trees, to determine the ratio of 1976 infested trees to those infested in 1975.

Ground surveys, in the form of "strip cruises," were conducted in late August when the adult flight period was complete. Each individual build-up survey consisted of a series of lines run through the area of infestation one-half chain (line 1) or 1 chain (lines 2 through 5) in width and of sufficient length to adequately cover the area of infestation. All 1975 and 1976 infested trees were tallied by dbh within the one-half chain or 1 chain-width cruise area. (Table 1)

RESULTS

Five areas were ground-surveyed to determine build-up ratios. All five areas showed a reduction of 1976 attacked trees to 1975 attacked trees. The average infested tree build-up for the Middle Park area was found to be 1.0, 1975 to 0.48, 1976-infested trees. Infested trees per acre for 1975 and 1976 averaged 1.75 and 0.84 respectively. Eight comandra rust killed trees were found on the 38.2 acres surveyed, averaging 1 tree killed on every 4.78 acres. Dwarf mistletoe infestation was moderate overall with some heavily infested areas.

DISCUSSION

The most effective method of suppressing the mountain pine beetle is through a combined program of logging infested trees and timely silvicultural treatment to remove or reduce the inventory of larger diameter highly susceptible trees. Suppression efforts should not rely entirely on logging of infested trees, since epidemic potential remains as long as there is a high inventory of large diameter lodgepole pine. The beetles usually are epidemic in a stand until the average diameter of the stand is reduced below 8 inches. Although logging of infested trees provides immediate relief in a given stand, this does not insure against recurring losses within the remaining stand. Reduction of the inventory of larger diameter, susceptible trees can provide conditions to improve the growth of smaller crop trees. Stands with smaller healthy, vigorous-growing trees are not as susceptible to losses by the mountain pine beetle as stands containing large diameter trees. Logging infested trees, combined with silvicultural treatment that will reduce the inventory of large diameter, mature and overmature trees, will serve as a preventative measure against recurring losses. Removal of dwarf mistletoe infected trees is also a good forestry practice. It is imperative that a timely program of thinning large diameter trees be implemented in areas in which funds are expended for logging infested trees. (Guidelines for reducing Losses of lodgepole pine to the Mountain Pine Beetle in the Central and Northern Rocky Mountains; Amman, McGregor, Cahill and Klein: first draft.) Based on data from this year's aerial survey and ratio cruises it is estimated that the mountain pine beetle kill will drop significatly compared to 1975 losses.

RECOMMENDATIONS

Due to the significant reduction in tree loss to the mountain pine beetle, general application of direct control measure is not recommended. Chemical treatment or burning of infested trees are alternatives. With the current population trend, additional evaluation of each situation may be necessary where direct control measure are taken. Landowners can use "Pine Tree and Ornamental Spray"[2/] to prevent the loss of high value

---

2/ "Pine Tree and Ornamental Spray" is the only preventive spray registered in Colorado for use against mountain pine beetle. The spray is formulated by Balcom Chemical Inc., 240 22nd Street, Greeley, Colorado 80631

trees. With the downward trend in beetle population, land managers can now get ahead of the beetle and reduce the chance of future build-up of the population by reducing the inventory of larger diameter lodgepole pines.

Reduction of the inventory of large diameter lodgepole pine is imperative for effective control of the mountain pine beetle. Removal of large diameter trees along with diseased and damaged trees is also advantageous to land managers in improving stand vigor.

TABLE 1

BUILD-UP RATIO SURVEY DATA

LINE	ACREAGE	1976 INFESTED	1975 INFESTED	BUILD-UP RATIO	COMANDRA MORTALITY
1	2.8	6	2	1:0.33	2
2	7.7	1	0	1:0.00	4
3	5.3	7	1	1:0.14	0
4	10.8	14	9	1:0.64	0
5	11.6	39	29	1:0.74	2
TOTALS	38.2	67	32		8
AVERAGES				1:0.48	

PESTICIDE USE STATEMENT

Pesticides used improperly can be injurious to man, animals, and plants. Follow the directions and heed all precautions on the labels.

Store pesticides in original containers under lock and key -- out of the reach of children and animals -- and away from food and feed.

Apply pesticides so that they do not endanger humans, livestock, crops, beneficial insects, fish, and wildlife. Do not apply pesticides when there is danger of drift, when honey bees or other pollinating insects are visiting plants, or in ways that may contaminate water or leave illegal residues.

Avoid prolonged inhalation of pesticide sprays or dusts; wear protective clothing and equipment if specified on the container.

If your hands become contaminated with a pesticide, do not eat or drink until you have washed. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label, and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove clothing immediately and wash skin thoroughly.

Do not clean spray equipment or dump excess spray material near ponds, streams, or wells. Because it is difficult to remove all traces of herbicides from equipment, do not use the same equipment for insecticides or fungicides that you use for herbicides.

Dispose of empty pesticide containers promptly. Have them buried at a sanitary land-fill dump, or crush and bury them in a level, isolated place.

NOTE: Some States have restrictions on the use of certain pesticides. Check your State and local regulations. Also, because registrations of pesticides are under constant review by the U. S. Department of Agriculture, consult your county agricultural agent or State Extension specialist to be sure the intended use is still registered.